"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.M., doktor tekhn.nauk; ADAMENKO, A.I., kand.tekhn.nauk

Operation of three-phase motors supplied by a single-phase 440 volt network. Mekh. i elek. sots. sel'khoz. 16 no.4:33-35 '58. (MIRA 11:10)

1. Institut elektrotekhniki AN USSR.
(Electric motors, Induction)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.M., doktor tekhn. nauk, prof.

Method for calculating compounded synchronous motors. Elektrichestvo no.3:1-9 Mr '58. (MIRA 11:5)

(Electric motors, Synchronous)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I. M.

POSTNIKOV, I.M., doktor tekhn. nauk; ADAMENKO, A.I., inzh.

Special considerations in designing single-phase asynchronous motors. Vest. elektroprom. 28 no.10:28-35 O '57. (MIRA 10:12)

1. Institut elektrotekhniki AN USSR.
(Electric motors, Induction)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

Postnikov, I.M.

545. CALCULATION OF ELECTRODYNAMIC FORCES IN TRANSFORMER WINDINGS. I.M.Postnikov. 621.314.2

Elektrichestvo, 1957, No. 8, 9-15. In Russian.

In the method presented the author considers the axial forces for symmetrically placed windings and deals with the case of axial forces in windings of unequal length. The force is then expressed in terms of the relative short-circuit parameters, and expressions follow for the axial forces for symmetrical or slightly asymmetrical winding arrangements. The problem of the radial forces is also briefly treated. Central Electricity Generating Board Digest

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.M., doktor tekhnicheskikh nauk, professor.

On calculating electromagnetic forces in transformer windings.
Elektrichestvo 8:9-15 Ag '57. (MLRA 10:9)

1. Kiyevskiy politekhnicheskiy institut.
(Electric transformers)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I. M.

AUTHOR: POSTNIKOV, I.M., Prof., Dr. techn. sc. 105-8-2/20

TITLE: On the Calculation of Electrodynamic Forces in Transformer Windings. (O raschëte elektrodinamicheskikh sil v obmotakh transformatorov, Russian)

PERIODICAL: Elektrichestvo, 1957, Nr 8, pp 9 - 15 (U.S.S.R.)

ABSTRACT: A simpler and theoretically better founded method of calculation is given here. The assumptions are equal to those usually made in the calculation of mean forces. The axial forces of symmetrically arranged windings, and those of different lengths of windings are calculated. The forces are described by relative short-circuit parameters. Thereafter the axial compressive forces are investigated in the case of symmetrical arrangement of the windings and it is shown that in this or in the case of a small asymmetry the axial forces of the current in winding 1 tend to pull apart the winding 2, whereas the axial forces of the own current of winding 2 tend to press them together. As far as the magnetizing force of both windings is equal, both forces compensate one another and only the axial compressive forces of the own dispersion streams of windings 1 and 2 resp. remain. A more accurate method for the calculation of radial forces and an example on it are also given.

Card 1/2

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I. M.

110-10-6/18

AUTHOR: Postnikov, I.M., Doctor of Technical Sciences and Adamenko, A.I., Engineer.

TITLE: Special Features of the Design of Single-phase Induction Motors. (Osobennosti proyektirovaniya odnofaznykh asinkhronnykh elektro dvigateley)

PERIODICAL: Vestnik Elektropromyshlennosti, 1957, Vol.28, No.10, pp. 28 - 35 (USSR)

ABSTRACT: The main types of single-phase induction motors are described. The simplest is a three-phase motor with one-phase disconnected. The starting characteristics of such a motor are poor and a starting winding is provided and supplied through a reactance. In order to improve the starting characteristics it is necessary to depart from the best phase zone for a single-phase winding. The power of the motor may be increased by using the starting windings during normal operation and supplying them through a capacitor of such a size that a circular rotating field is set up in the air gap. If the capacitor is of such a value that there is resonance between the capacitor and the auxiliary winding the starting torque can be high. When high starting torque is not required it is better to use a small capacitor. Different connections of capacitor that are considered include parallel and series-

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

parallel and the use of a capacitor in one phase of a standard three-phase winding.

The use of motors in which the rotor current is displaced is then considered. Yu.S. Chechet proposed to use normal three-phase motors for outputs of up to 5 kW without any modifications as single-phase capacitor motors, single-phase capacitor start motors or rheostat motors or as single-phase capacitor motors with rheostat starting and he also suggested that standard series A induction motors fully meet the demands for agricultural drives including single-phase current, provided that the production of starting equipment is organised.

D.I. Sekretev concluded that motors in which the rotor current is displaced are quite unsuitable for single-phase supply. As the results of tests on single-phase capacitor motors obtained by re-winding three-phase motors he showed that if rotor current displacement is used it is difficult to start the motors. These motors had a fractional number of stator slots per pole and per phase so that there were a number of even and odd harmonics in the m.m.f. curve. Because of this, Sekretev's conclusion is not valid and investigations on single-phase capacitor motors carried out in the Electro-technical Institute of the Ac.Sc. of the Ukrainian SSR showed that motors with

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

rotor windings and to make some increase in the air gap. The Kharkov Works have used brass squirrel cage windings for capacitor motors for use in electric tractors. High-resistance rotors have also been used for mining type locomotives. Rules are given about the selection of the number of slots in the rotor and stator and the influence of the width of the phase zone on the power of the motor is considered. The power of single-phase capacitor motors produced from three-phase motors when the phase zones are 120° and 60° when operating with approximately equal phase current are 15-20% less than the power of the initial three-phase motors. Single-phase capacitor motors with phase zones of 90° are of 6% less power than the corresponding three-phase motors. This means that the use of a three-phase motor as single-phase with capacitance in one phase increases the cost by 10 - 18% compared with the cost of a motor with symmetrical windings.
There are 8 figures, and 5 Slavic references.

ASSOCIATION: Electro-technical Institute of Ac.Sc. Ukrainian SSR. (Institut Elektrotekhniki AN USSR)

SUBMITTED: February 19, 1957.

AVAILABLE: Library of Congress

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

LUGOVOY, V.S.; POSTNIKOV, I.M.

Method for the electrical calculation of resonant circuits with compensation of losses. Trudy Inst.vod.khoz.i energ.AN Kir.SSSR no.3:97-112 '56. (MLRA 9:11)

(Electric circuits)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I. M., professor, doktor tekhnicheskikh nauk; PAVLOV, V. M., kandidat tekhnicheskikh nauk; BORUSHKO, V. S., inzhener

Use of solid poles in large hydraulic generators. Vest. elektroprom. 27 no. 11:38-40 N '56 (MLRA 9:12)

1. Kiyevskiy politekhnicheskiy institut (for Postnikov and Pavlov).
2. Khar'kovskiy Elektromekhanicheskiy i turbogeneratornyy zavod for Borushko.

(Electric generators)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.M.

Methods for the theoretical study of single-phase capacitor motors
Sbor.trud.Inst.elektrotekh.AN URSR no.14:5-51 '56. (MLRA 9:12)
(Electric motors, Induction)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.M., doktor tekhnicheskikh nauk, professor; AKAMENKO, A.I., inzhener.

Parameters of an equivalent circuit and an accurate circle diagram of an asynchronous machine. Elektrichestvo no.12:25-28 D '55. (MLRA 9:3)

1. Institut elektrotekhniki Akademii nauk USSR.
(Electric machinery)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.M.

621.313.33 : 621.3.012.8

2105. PARAMETERS OF THE EQUIVALENT CIRCUIT AND OF THE EXACT CIRCLE DIAGRAM OF AN ASYNCHRONOUS MACHINE. I.M.Postnikov and A.I.Adamenko. Elektrichestvo, 1955, No. 12, 25-8. In Russian.

It is often advisable to transform the T-type equivalent circuit into the Γ-type circuit for plotting an accurate circle diagram of an asynchronous machine with constant parameters. However, widely used methods of determining the parameters of the secondary circuit and the angular displacement of the co-ordinate axes of the secondary circle are not always correctly applied, e.g. the value and direction of the displacement angle depend on the ratio of resistances and reactances of primary and magnetizing circuits which is not considered in the usual method. The correct method of determining the impedance of the main circuit is presented. Also, a simple method of plotting the circle of the magnetizing current is explained. The diameter of this circle is equal to the diameter of the circle of the primary current multiplied by the ratio of the moduli of the impedances of the primary and magnetizing circuits. Plotting of magnetizing current circle enables the effective currents of the T-type equivalent circuit to be determined graphically. The ratio of the impedances of primary and magnetizing circuits determines the choice of the method of plotting the circle diagrams. If this ratio is smaller than a certain value, simpler equivalent circuits and circle diagrams may be used for the representation of the asynchronous machine. It is also shown that the consideration of the iron losses by insertion of active resistances into the magnetizing circuit may be theoretically interpreted by introduction of the complex magnetic permeance. B.F.Kraus

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.M.; NOVIKOV, A.V.

Asynchronous moment, created by the excitation winding closed at the capacitance in a synchronous machine. Nauch.dokl.vys.shkoly; elektromekh. i avtom. no.1:89-92 '59. (MIRA 12:11)

1. Rekomendovana kafedroy elektricheskikh mashin Kiyevskogo ordena Lenina politekhnichseskogo instituta.
(Electronic machinery, Synchronous)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

8(5)

AUTHORS: Postnikov, I. M., Doctor of Technical Sciences, Professor, Lishchenko, A. I., Candidate of Technical Sciences (Kiyev) SOV/105-59-7-2/30

TITLE: On the Calculation of the Characteristics and the Overloading Capacity of Compounded Synchronous Motors (O raschete kharakteristik i peregruzhayemosti kompaundirovannykh sinkhronnykh dvigateley)

PERIODICAL: Elektrichestvo, 1959, Nr 7, pp 8 - 13 (USSR)

ABSTRACT: The results obtained by an experimental investigation and precise description of the methods of calculating the characteristics and overloading capacity of compound motors, which have already been dealt with by other papers (Refs 1,2) are discussed. The experiments were carried out on a motor of the ASDK-type having a power output of 40 kw, 380 v, and 1000 rotations per minute. The process of calculating the excitation system and the characteristics of the motor is described. Analytical and graphical methods of developing operational characteristics, and, finally, experimental and calculated results are compared. This comparison shows the satisfactory results are obtained by the calculation method described. The experiments carried out with synchronized

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

On the Calculation of the Characteristics and the Overloading SOV/105-59-7-2/30
Capacity of Compounded Synchronous Motors

asynchronous motors showed it to be of advantage to use them both in the case of direct and indirect compounding, especially in such cases in which an increase of cos φ of the devices without using any special means of compensation is desired. There are 4 figures and 3 Soviet references.

SUBMITTED: January 3, 1959

Card 2/2

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.M., doktor tekhn.nauk prof.; ADAMENKO, A.I., kand.tekhn.nauk

Reserves should be used more fully in the electrification of railroads with single-phase alternating current. Izv.vys. ucheb.zav.; energ. 2 no.8:1-3 Ag '59. (MIRA 13:2)

1. Institut elektrotekhniki AN USSR.
(Railroads--Electrification)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I. S., Engineer

"Regularities in Decreasing the Concentration of Organic Contaminators During Decontamination of Sewage and Their Utilization for Calculation of Biological Filters With High Loading." Thesis for degree of Cand. Technical Sci. Sub 16 May 50, Academy of Municipal Economy imeni K. D. Pamfilov.

Summary 71, 4 Sep 52, Dissertations Presented for Degrees in Science and Engineering in Moscow in 1950. From Vechernyaya Moskva, Jan-Dec 1950.

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.S.

Planning aeration tanks with separate reactivation of sludge. Vod. i san. tekh. no.8:17-19 Ag '58. (MIRA 11:9)
(Sewage--Purification)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

BEZENOV, V.V., kand.tekhn.nauk; MASLENNIKOV, N.A., kand.tekhn.nauk;
POSTNIKOV, I.S., kand.tekhn.nauk.

Mechanical spray-jet-type aerator. Gor. khoz. Mosk. 32 no.9:26-27
S '58. (MIRA 11:9)
(Sewage--Purification)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.S.; ARUTYUNYAN, K.G.; TUGUSHEVA, N.Yu.; EL', M.A.; KARYUKHINA, T.A.

Semi-industrial studies of air tanks or clarifiers developed by the Academy of Municipal Economy at the Kur'ianovskii aeration station. Sbor. nauch. rab. AKKH no.6:15-35 '61. (MIRA 15:3)
(Sewage--Purification)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.S.; BELYAYEVA, M.A.; TSITOVICH, S.I.

Horizontal primary clarifiers and activated sludge precipitation tanks. Sbor. nauch. rab. AKKH no.6:36-51 '61. (MIRA 15:3)
(Sewage--Purification)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

BEZENOV, V.V.; POSTNIKOV, I.S.; FIKHMAN, A.N.

Investigation of the process of using oxygen for liquid waste mixtures having active slime. Vod. i san. tekh. no. 8:22-26 Ag '56. (MLRA 9:10)

(Sewage--Purification)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.S.

Calculating aero-tanks. Vod. i san.tekh. no.10:28-31 O '56. (MLRA 10:2)

(Sewage--Purification)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, L.S.; TSITOVICH, S.I.

Daily automatic sampling of waste waters. Vod. i san. tekh. no.4:29-30 Ap '57. (MIRA 10:6)

(Sewage--Analysis)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, Igor' Sergeyevich; TSITOVICH, Sergey Ivanovich; TUGUSHEVA, Narkis Iosifovna; RACHEVSKAYA, M.I., red.izd-va; SHLIKHT, A.A., tekhn.red.

[Preliminary purification of liquid wastes with the use of activated sludge] Predvaritel'naia ochistka stochnoi zhidkosti metodom biokoaguliatsii. Pod obshchei red. I.S.Postnikova. Moskva, Izd-vo M-va kommun.khoz. RSFSR, 1958. 86 p. (MIRA 12:4)
(Sewage--Purification)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.S., red.

[Purification of waste waters in aeration-settling tanks of the Academy of Municipal Service] Ochistka stochnykh vod v aerotenkakh-otstoinikakh AKKH. 11p (Akademiia kommunal'nogo khoziaistva Informatsionnoe pis'mo, no. 3) (MIRA 14:1)
(Sewage--Purification)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.S.; BELYAYEVA, M.A.; FROLOV, F.A.; IVANOVA, O.D.

Study of methods for improving the active sludge regeneration process in air tanks. Nauch. trudy AKKH no.20:12-22 '63. (MIRA 18:12)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.S.; KHARITONOV, D.F.; KOMAROVA, N.P.; BELYAYEVA, M.A.

Purification of city waste water in high biofilters. Nauch. trudy AKKH no.20:23-39 '63. (MIRA 18:12)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.S.; ARUTYUNYAN, K.G.; TUGUSHEVA, N.I.; EL', M.A.;
KARYUKHINA, T.A.

Investigating the operation of an air sedimentation tank at the Kur'yanovo aeration station. Nauch. trudy AKKH no.20:80-96 '63.
(MIRA 18:12)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, L.S.; ARUTYUNYAN, K.G.; TUGUSHEVA, N.I.

Laboratory investigation of the process of waste water purification with the separate regeneration of active sludge. Nauch. trudy AKKH no.20:40-54 '63. (MIRA 18:12)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, Igor' Semenovich; RACHEVSKAYA, M.I., red.izd-va; VOLKOV, S.V., tekhn.red.

[Purification of sewage in the German Democratic Republic] Ochistka stochnykh vod v Germanskoi Demokraticheskoi Respublike. Moskva, Izd-vo M-va kommun.khoz.RSFSR, 1959. 113 p. (MIRA 14:3)

(Germany, East--Sewage--Purification)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.S., kand.tekhn.nauk

Survey and analysis of the operation of air tanks. Nov. tekh.zhil.-kom. khoz.; Vod. i kan. no.2:107-131 '63. (MIRA 17:9)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

RUBINSHTEYN, R.N.; POSTNIKOV, I.V.; VASIL'YEV, I.G.

Study on diffusion under nonlinear boundary conditions. Zav. lab. 30 no.7:806-812 '64. (MIRA 18:3)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, I.V.; RUBINSHTEYN, R.N.

Determination of the coefficients of diffusion and solubility of volatile elements in solid solutions. Zav.lab. 27 no.11:1364-1369 '61. (MIRA 14:10)

(Solutions, Solid) (Diffusion)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

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L 52225-65 EWT(d) Pg-4 IJP(c)

ACCESSION NR: AP5009915

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532.72

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B

AUTHORS: Rubinshteyn, R. N.; Postnikov, I. V.

TITLE: Diffusion at nonlinear boundary conditions

SOURCE: Zavodskaya laboratoriya, v. 31, no. 4, 1965, 444-450

16

TOPIC TAGS: nonlinear system, ordinary differential equation, diffusive motion, impurity content, evaporation

ABSTRACT: The impurity distribution in the volume of a solid body during evaporation is studied analytically. When the vapor is in equilibrium with the solid phase and consists of monatomic molecules, the problem is shown to be linear. For this case, the concentration at any point within the body can be estimated to within 3% as the sum of the concentrations at the surface and in the volume. This concentration, $U(z, \theta)_{n=1}$, is drawn in the form of a nomogram. For the case of a plate with finite thickness 2ℓ and nonlinear boundary conditions

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L 52225-65

ACCESSION NR: AP5009915

$$D\frac{\partial C}{\partial x}\Big|_{x=+l} = -A_n C^n,$$

$$D\frac{\partial C}{\partial x}\Big|_{x=-l} = A_n C^n,$$

the diffusion equation is obtained in the form

$$\frac{dU}{d\varphi} = -\sigma^2 U,$$

where

$$U = \frac{\bar{C}}{\left(\frac{D}{A_n l}\right)^{\frac{1}{n-1}}},$$

$$\varphi = \frac{Dt}{l^2},$$

and σ is the first root of the transcendental equation

$$\sigma^{\frac{n-2}{n-1}} (\mathrm{ctg}\,\sigma)^{\frac{n}{n-1}} = \frac{1}{U}.$$

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

L 52225-65

ACCESSION NR: AP5009915

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The asymptotic solutions of these equations are discussed briefly for $U \ll 1$ and $U \gg 1$, and then a numerical solution is obtained for $n = 2$ and is plotted graphically. Also plotted are the functions $dU/d\varphi$ versus φ and the concentration distribution $C(x)$ from the equation

$$\frac{C(x)}{\bar{C}} = \sigma_1 \frac{\cos \sigma_1 \frac{x}{l}}{\sin \sigma_1},$$

which is the solution of the diffusion equation with the linear boundary conditions

$$\begin{cases} D \left.\frac{\partial C}{\partial x}\right|_{x=+l} = -AC \\ D \left.\frac{\partial C}{\partial x}\right|_{x=-l} = AC. \end{cases}$$

These results are shown to be directly applicable to the desorption process with convex Freyndlikh type isotherms. Orig. art. has: 22 equations and 5 figures.

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

L 52225-65

ACCESSION NR: AP5009915 0

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: ME

NO REF SOV: 003 OTHER: 000

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Card 4/4

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30038

S/032/61/027/011/005/016
B116/B102

18.7500

AUTHORS: Postnikov, I. V., and Rubinshteyn, R. N.

TITLE: Determination of the diffusion coefficients and the solubility of volatile elements in a solid solution

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 11, 1961, 1364-1369

TEXT: The authors describe a method for determining the diffusion coefficients and the relation between the vapor pressure and the concentration of volatile admixtures in a solid solution. This method is then used to determine the diffusion coefficients and the concentration of antimony in germanium. It is based on the theory of regular conditions. The sample used is alloyed with a volatile admixture and then annealed in vacuo. After a certain time, the concentration of the alloying component is given by $C(x, y, z, \tau) = A \exp\left\{-\frac{\lambda^2 D\tau}{l^2}\right\} f(x, y, z, \lambda)$ (1). Since the distribution function f (x, y, z, λ) is not time-dependent and if radioisotopes are

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Determination of the diffusion ...

alloyed, the following relation will be valid under regular conditions:

$\log \frac{\dot{I}}{\dot{I}_0} = -0.43 \frac{\lambda^2 D\tau}{l^2} + \text{const}$ (3), where λ is a constant determined by the shape of the sample and by the dimensionless parameter $\frac{\alpha \bar{v} l}{D\Gamma}$; $f(x,y,z,\lambda)$ does not depend on the amount of admixture and on the method of addition; A is a constant dependent on the initial distribution; D is the diffusion coefficient; l is the characteristic dimension of the sample; $\bar{v}$ is the arithmetic mean of the thermal velocity of the volatile molecule; α is the accomodation coefficient; $\Gamma = C_{surface}/n_{surface}$, where $C_{surface}$ is the concentration of diffusing admixture at the surface of the solid, and $n_{surface}$ is the concentration of diffusing admixture in the gaseous phase (where $n_{surface}$ is in equilibrium with $C_{surface}$); I is the radiation intensity of the sample, and I_0 is that of a standard. If $\frac{\alpha \bar{v} l}{D} \gg 1$, the distribution expressed by (1) will remain unchanged even at another

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B116/B102

Determination of the diffusion ...

temperature. This fact may be utilized to study the temperature dependence of diffusion coefficients on one and the same sample. Volatile admixtures can be introduced into semiconductor materials by vapor annealing. The vapor pressure of the volatile substance has to be much lower than the equilibrium pressure; otherwise a new phase might occur at the surface of the semiconductor. In their experiments, the authors alloyed a germanium sample with antimony in a special device. The admixture was evaporated in the same device. The sample whose temperature was kept constant was annealed in another device. Annealing took 6-12 hr. The samples were periodically taken out of the furnace, and the concentration of residual admixtures was determined. The diffusion coefficients, the constant $D_o = 2.4\ cm^2/sec$, and the activation energy $E = 47,000$ cal/mole were determined from Eq. (3), and the experimental curves. The following method is recommended for simultaneous determination of the equilibrium concentration at the semiconductor surface and of the diffusion coefficients at two different temperatures: The amount of admixture remaining in the sample after vacuum annealing can be expressed by

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Determination of the diffusion ...

$$\frac{q}{C_0 l s} = \frac{8}{\pi^2} \sum_{k=0}^{\infty} \frac{\left(1 - \exp\left\{-\pi^2 (2k+1)^2 \cdot \frac{D_1 t}{l^2}\right\}\right) \exp\left\{-\pi^2 (2k+1)^2 \frac{D_2 \tau}{l^2}\right\}}{(2k+1)^2} \qquad (5)$$

if $\frac{l}{D} \gg 1$. q is the amount of substance diffusing into a flat plate during the time t (if $\frac{l}{D} \ll 1$); C_0 is the concentration which is in equilibrium with the vapor pressure over the pure volatile component at the temperature of the low-temperature region; s is the surface area of the plate; D_1 and D_2 are the diffusion coefficients obtained by annealing in vapor and vacuo, respectively, at different temperatures; t and τ are the corresponding annealing times. Next, q is determined after annealing, and the experimental points are entered in the diagram (Fig.5). $C_0 ls$ and $1/D_2$ as well as l^2/D_1 are simultaneously obtained from the ordinate, the abscissa, and the z-curve parameter, respectively, with which the experimental points agree. C_0, D_1, and D_2 are obtained from these data. A paper of V. M. Kozlovskaya (R. N. Rubinshteyn, V. M. Kozlovskaya. Fizika tverdogo tela, 3, 11 (1961)) is mentioned.

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Determination of the diffusion ... B116/B102

There are 5 figures, 1 table, and 7 references: 2 Soviet and 5 non-Soviet. The four most recent references to the English-language publications read as follows: F. M. Smits, R. C. Miller. Phys. Rev., 104, 1242 (1956); R. C. Miller, F. M. Smits. Phys. Rev., 107, 1, 65 (1957); M. C. Coupland. Proc. Phys. Soc., 73, 4, 472 (1959); K. Lehovec. Appl. Phys., 28, 4 (1957).

Fig. 5. $\frac{q}{C_o ls} = f\left(\frac{D_2 \tau}{l^2}\right)$ at different values of the parameter $z = \frac{D_1 t}{l^2}$.

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

SOV/32-24-9-32/53

AUTHORS: Rubinshteyn, R. N., Postnikov, I. V., Iyevlev, A. P.

TITLE: The Analytical Part of the Apparatus for the Vacuum Extraction of Gases Without Mercury (Analiticheskaya chast' ustanovki dlya vakuumnoy ekstraktsii gazov bez rtuti)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 9, pp 1135-1141 (USSR)

ABSTRACT: An apparatus is described by means of which the content of H_2, H_2O, CO_2, and CO, and, from the difference, the sum of argon and nitrogen can be determined. The arrangement of the analytical part is described as a special feature and illustrated by a diagram; this part functions on the principle of fractional freezing-out between the gas source and the diffusion pump. It can be seen from the operation, among others, that hydrogen and CO are oxidized to water and CO_2 by copper oxide in a furnace. The pressure, measured by a tube LT-2 or another manometer of the Pirani type, determines the nitrogen and argon contents. It is supposed that the described pattern is applicable only to the range of a Knudsen flow. The operation of the oxidation

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SOV/32-24-9-32/53

The Analytical Part of the Apparatus for the Vacuum Extraction of Gases Without Mercury

furnace is investigated more precisely and a number of mathematical explanations are given. The calculations mentioned make it possible to choose parameters, with any type of oxidation furnace, which secure a certain process time, or vice versa no matter how the oxidation furnace is built. In order to test the accuracy of the analysis, a gas mixture of known content of H_2, CO, CO_2 and N_2 was used. It follows from the table given, among others, that at temperatures below 1000°K there is a complete oxidation of H_2 and CO, which process occurs, however, at a significantly lower velocity below 670°K.
There are 6 figures, 3 tables, and 1 reference, which is Soviet.

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, L.

Moving Pictures

Consolidate our gains. Kinomekhanik no. 4 1952

Monthly List of Russian Accessions, Library of Congress, June 1952. Unclassified

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

LANKOV, G.P.; POSTNIKOV, L.L.

Magnetic materials for the sealing of refrigerator doors. Khol. tekh. 42 no.4:73 Jl-Ag '65. (MIRA 18:9)

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, L.L.

Using polymer materials in the manufacture of railroad cars. Biul. tekh.-ekon. inform. Gos. nauch.-issl. inst. nauch. i tekh. inform. 17 no.6:29-33 Je '64.

(MIRA 17:11)

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ACCESSION NR: AT5006090 S/0000/64/000/000/0137/0145

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B+1

AUTHOR: Vasil'yev, R.F.; Vichutinskiy, A.A.; Zakharov, I. V.; Karpukhin, O. N.; Postnikov, L. M.; Shlyapintokh, V. Ya.

TITLE: Chemiluminescence 21 in the study of the kinetics and mechanism of chemical reactions of organic compounds

SOURCE: Soveshchaniye po fizicheskim metodam issledovaniya organicheskikh soyedineniy i khimicheskikh protsessov. Frunze, 1962. Trudy. Frunze, Izd-vo Ilim, 1964, 137-145

TOPIC TAGS: reaction kinetics, organic mechanism, chemiluminescence, radical recombination, luminescence spectrum, hydrocarbon oxidation, hydroperoxide decomposition

ABSTRACT: The article deals with the chemiluminescence, produced by recombination in radical reactions. Measurement of the intensity of chemiluminescence at various temperatures provides a rapid method for determining the initiation rate or the activation energy of decomposition of the initiator of the reaction. The temperature dependence of the intensity of chemiluminescence in the course of oxidation of various hydrocarbons initiated by different hydroperoxides is discussed,

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and the kinetics of catalyzed oxidation and hydroperoxide decomposition is considered on the basis of data in the literature. It is noted that the activation of chemiluminescence by additions of luminescing substances shifts the limits of applicability of chemiluminescence methods toward lower temperatures and reagent concentrations (i.e., low reaction rates and low intensities of luminescence). Chemiluminescence is therefore a convenient method of studying the kinetics of certain chemical reactions. Orig. art. has: 5 figures, 4 formulas and 2 tables.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Chemical physics institute, AN SSSR)

SUBMITTED: 19Jun64 ENCL: 00 SUB CODE: OC

NO REF SOV: 018 OTHER: 002

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6

CA POSTNIKOV, L.M

Kinetics of the hydrolysis of pyrophosphoric acid at different pH's. L. M. Postnikov (Moscow State Univ.). *Vestnik Moskov. Univ.* 5, No. 5, *Ser. Fiz.-Mat. i Estest. Nauk* No. 3, 63-7(1950).—The rates of the hydrolysis $P_2O_7^{----} + H_2O \rightarrow 2\,PO_4^{---} + 2H^+$ in 0.012 *M* soln. in H_2O at 100° were detd. at different pH's, corresponding to different Na pyrophosphates, by pptn. with $AgNO_3$ and acidimetric titration with phenol red. The rates are 1st order, with the following values of the rate const. *k* (sec.$^{-1}$) and the half time *τ* (min.): $H_4P_2O_7$ (pH 1.02) $k = 8.3 \times 10^{-4}$, $\tau = 14.5$; $NaH_3P_2O_7$ (pH 2.07) 2.4×10^{-4}, 47.5; $Na_2H_2P_2O_7$ (pH 3.21) 1.44×10^{-4}, 80; $Na_3HP_2O_7$ (pH 7.30) 7.8×10^{-6}, 108.5. The value of $k = 1.7 \times 10^{-8}$ for $Na_4P_2O_7$ (pH 9.33) detd. by Bell (C.A. 41, 1913c) fits these data; *k* increases rapidly with falling pH in the high-pH range, and much more slowly in the low-pH range. N. Thon

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L 9865-63 EPF(c)/EWT(l)/EWT(m)/BDS--AFFTC/ASD--Pr-4--RM/WW/MAY/IJP(C)
ACCESSION NR: AP3001349 S/0048/63/027/006/0735/0738

66
65

AUTHOR: Postnikov, L. M.; Shuvalov, V. F.; Shlyapintokh, V. Ya.

TITLE: Nature of chemiluminescence associated with low-temperature oxidation of acetaldehyde [Report of the Eleventh Conference on Luminescence held in Minsk from 10 to 15 September 1962]

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v. 27, no. 6, 1963, 735-738

TOPIC TAGS: chemiluminescence, vapor phase reactions, reaction kinetics, acetaldehyde

ABSTRACT: Chemiluminescence - luminescence accompanying chemical reactions - has been under study at the Institute of Chemical Physics of the Academy of Sciences SSSR for several years, and it has been established that the emission appears as a result of radical recombination. Most of the previous studies, however, were concerned with reactions in the liquid phase. Accordingly, it was deemed of interest to investigate reactions in the vapor phase. Chemiluminescence has been observed (in some cases for the first time) incident to decomposition of methyl

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hydroperoxide, oxidational decomposition of deuteric butyl peroxide and azomethane, slow oxidation of n-butane, ethyl ether, acetaldehyde, etc. The present experiments were carried out in a 550 cc molybdenum glass reaction vessel at temperatures from 100 to 200°C and initial pressures from tens to hundreds mm Hg. The variations in chemiluminescence and pressure were recorded automatically; when indicated, the end products were subjected to chemical analysis. The time variation of the chemiluminescence incident to oxidation of acetaldehyde proved to be distinctive; most curves exhibit two peaks; one sharp, the other flat (the time curves and spectra for oxidation of acetaldehyde are reproduced). This indicates that the reaction proceeds in two stages. Hence observation of chemiluminescence provides a means for studying the kinetics of some chemical reactions. Orig. art. has: 3 figures.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences, SSSR)

SUBMITTED: 00 DATE ACQ: 01Jul63 ENCL: 00

SUB CODE: PH, CH NR REF SOV: 006 OTHER: 006

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, L.M.; SHLYAPINTOKH, V.Ya.; SHUMILINA, M.N.

Chemiluminescence in slow chemical reactions. Part 4: Chemiluminescence used in studying the kinetics of gas phase oxidation. Kin. i kat. 6 no.2: 185-195 Mr-Ap '65. (MIRA 18:7)

1. Institut khimicheskoy fiziki AN SSSR.

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

SHLYAPINTOKH, V.Ya.; POSTNIKOV, L.M.; KARPUKHIN, O.N.; VERETIL'NYY, A.Ya.

Chemiluminescence during alternating current electrolysis. Zhur.fiz. khim. 37 no.10:2374-2375 O '63. (MIRA 17:2)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

SHUVALOV, V.F.; VASIL'YEV, R.F.; POSTNIKOV, L.M.; SHLYAPINTOKH, V.Ya.

Formation of excited formaldehyde molecules by low temperature oxidation of acetaldehyde. Dokl. AN SSSR 148 no.2:388-390 Ja '63. (MIRA 16:2)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom V.N. Kondrat'yevym.

(Formaldehyde) (Acetaldehyde) (Oxidation)

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, L.M.; SHLYAPINTOKH, V.Ya.

Mechanism of the formation of excited formaldehyde molecules in oxidation reactions. Dokl. AN SSSR 150 no.2:340-342 My '63. (MIRA 16:5)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom V.N.Kondrat'yevym.
(Formaldehyde) (Oxidation) (Reaction, Rate of)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, L.M.; SHUVALOV, V.F.; SHLYAPINTOKH, V.Ya.

Nature of chemiluminescence in the reaction of low-temperature oxidation of acetaldehyde. Izv. AN SSSR. Ser. fiz. 27 no.6: 735-738 Je '63. (MIRA 16:7)

1. Institut khimicheskoy fiziki AN SSSR.
(Acetaldehyde--Spectra) (Chemical reactions)

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

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B124/B186

5,4000

AUTHORS: Shuvalov, V. F., Vasil'yev, R. F., Postnikov, L. M., Shlyapintokh, V. Ya.

TITLE: Formation of excited formaldehyde molecules in low-temperature oxidation of acetaldehyde

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 2, 1963, 388-390

TEXT: The project consisted in determining the chemical nature of the luminescent particles in the oxidation of acetaldehyde. It is proved that in this reaction the luminescence is connected with the formation of excited formaldehyde molecules. Chemi-luminescence in reactions which proceed under formation of alkoxy radicals is also explained in this way. The luminescent particles in the slow oxidation of acetaldehyde in the gas phase are identified experimentally by taking the chemi-luminescence spectra with a high-power spectrometer developed by R. F. Vasil'yev, S. M. Petukhov and T. N. Zhuchkova; the instrument is described in ZhFKh, v. 36, No. 10, 2284 (1962). The chemi-luminescence spectrum of a mixture of 50 mm Hg acetaldehyde and 47 mm Hg oxygen was taken at 182°C, chemi-luminescence having a maximum value. The kinetic curve of chemi-luminescence has two peaks. In

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the section following the second peak the intensity of luminescence changes but little with time. It has been found that the spectrum taken in this section practically coincides with the fluorescence spectrum of formaldehyde. The formation of formaldehyde in the reaction products is proved also by chemical analysis. With the aid of light filters it was shown that between 180 and 120°C the position of the luminescence maximum and the total shape of the spectrum do not change. Hence it can be concluded that also at temperatures below 180°C the second luminescence maximum is related to the formation of formaldehyde. The kinetic curves of luminescence at 182°C and with a composition of the mixture of 50 mm Hg CH_3CHO and 35 mm Hg O_2 were taken at 370, 425, and 510 mμ. It was found that the intensity ratio remains practically constant. This proves that also in the region of the first peak, luminescence is connected with excited formaldehyde molecules. This example shows that the reactions necessary for the formation of excited formaldehyde molecules take place not only in cool flames but even at much lower temperatures. There are 3 figures.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

AUTHORS: Avramenko, L. I., Kolesnikova, R. V., Postnikov, L. M. 62-58-3-3/30

TITLE: A New Method for the Determination of the Velocity Constants of the Elementary Reactions of Atoms and Radicals (Novyy metod opredeleniya konstant skorostey elementarnykh reaktsiy atomov i radikalov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Khimicheskikh Nauk, 1958, Nr 3, pp. 277-284 (USSR)

ABSTRACT: The authors suggested a new method for the determination of the above-mentioned velocity constants which was worked out by them. This method avoids many a difficulty connected with the measurement of the absolute concentration of the atoms. The reaction of the oxygen-atom with different molecules serves as example. All processes which take place in the experiment are schematically represented (see scheme pp. 277 and 278). By means of the suggested method of measurement the summary velocity constant (in this case for the oxygen atom) can be determined. This also applies to the velocity constants of individual primary elementary reactions. It is

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

A New Method for the Determination of the Velocity Constants of the Elementary Reactions of Atoms and Radicals 62-58-3-3/30

pointed out that all conclusions are only valid in the case of sufficiently high A_0-values (initial concentration of the initial substance) in comparison with $(O)_0$ (initial concentration of the oxygen atoms). On the basis of the described method (see formulae 1-16) the velocity constants of the elementary reactions of the oxygen atoms with molecules such as CO, CH_4, CH_3OH were determined. Moreover the velocity constants of the reactions of the radicals CH_3 and C_2H_5 with the oxygen molecule were obtained. There are 13 references, 4 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute for Chemical Physics, AS USSR)

SUBMITTED: January 21, 1957

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APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, L.M.; SHLYAPINTOKH, V.Ya.; SHUVALOV, V.F.

Chemiluminescence in the gaseous oxidationof acetaldehyde.
Zhur.fiz.khim. 36 no.10:2284-2286 O '62. (MIRA 17:4)

1. Institut khimicheskoy fiziki AN SSSR.

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B013/B078

11.6200

AUTHORS: Avramenko, L. I., Postnikov, L. M.

TITLE: Kinetics and Mechanism of the Interaction of Methyl Radicals With Molecular Oxygen

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 11, pp. 1921 - 1929

TEXT: A study has been made of the reaction mechanism of methyl radicals with molecular oxygen at pressures ranging between 0.5-3.5 mm Hg and at temperatures of 100° - 450°K. A special system was used making it possible to suppress side reactions (Fig.1) (light effect in photochemical reactions). The main characteristic of the system is the circumstance that the production source of CH_3 radicals (place of the thermal dissociation of acetone) is separated from the reaction zone of CH_3 and O_2 by a nozzle. It was observed that of the two oxygen-containing reaction products - methyl hydroperoxide and carbon dioxide - the former is the chief product. The carbon dioxide amounted to ~30% of the amount of

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methyl hydroperoxide. Formaldehyde could not be found at higher temperatures either. Apart from the qualitative investigation of the reaction direction, it was also possible to measure the rate constants of primary elementary reactions on the mentioned system. For this purpose, the authors' own method (Ref.10) was applied: on the basis of an assumed reaction scheme, the effective rate constant of the reaction of methyl radicals with oxygen molecules can be determined by measuring formation of methyl hydroperoxide (Fig.2). The primary character of methyl hydroperoxide ensures a linear relationship between the reciprocal end value of the hydroperoxide concentration and the reciprocal initial value of the oxygen concentration (Fig.3). On the strength of the data obtained it is also possible to determine the absolute value of the rate constant of the "quadratic decomposition" (kvadratichnaya gibel') of methyl radicals k_0'''. The determination took place by the method described in Ref.11 (Fig.4). The results are in good agreement with results obtained by other authors (Table 1). Experiments were conducted at temperatures of 200° and at 300°K (Table 2). The curves obtained in this connection resemble those of Figs. 2-4. It was observed that the reaction of the methyl radical with the oxygen proceeds practically without activation

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Kinetics and Mechanism of the Interaction of Methyl Radicals With Molecular Oxygen

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B013/B078

energy. To test the effect of a third particle, the effective rate constant k was measured under acetone pressure, and it was observed that pressure has no effect on its magnitude (Fig.5). On the basis of experience gathered by several authors it was possible to establish the regularity of the effect of a third particle (acetone) upon the effective rate constant of the reaction of the methyl radical with oxygen molecule. By using the experimental straight line (Fig.5) and the equation (11) expressing it, the absolute value of the rate constants of elementary reactions was determined: bimolecular $CH_3 + O_2 \rightarrow CH_3OO$ and trimolecular $CH_3 + O_2 + M \rightarrow CH_3OO + M$. Equation (11): $k = k_2'(M) + k_1'$; k_1 - rate constant of bimolecular reaction; k_2 - rate constant of trimolecular reaction; M - concentration of third particle. There are 5 figures, 2 tables, and 21 references: 6 Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: June 23, 1959

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, L.M.; SHLYAPINTOKH, V.Ya.; SHUMILINA, M.N.

Evaluation of the lifetime of excited formaldehyde molecules formed in the reaction of gas-phase low temperature oxidation of acetaldehyde. Izv. AN SSSR. Ser. khim. no.11:1936-1941 '65. (MIRA 18:11)

1. Institut khimicheskoy fiziki AN SSSR.

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L 61926-65 EWT(1)/T/EWA(h) Pz-6/Peb IJP(c) UR/0141/65/008/002/0392/0399
AT 539.293.011.4 21
ACCESSION NR: AP5014510 2
B

AUTHOR: Postnikov, L. V.; Tarantovich, T. M.

TITLE: Contribution to the theory of electron-hole junctions 21

SOURCE: IVUZ. Radiofizika, v. 8, no. 2, 1965, 392-399

TOPIC TAGS: np junction, recification theory, junction equation, current voltage characteristic, operator equation

ABSTRACT: The purpose of the investigation was to find an approximate solution for the equations of an n-p junction for the case when the diffusion length is much larger than the Debye radius, and when the deviations of the carrier densities from their equilibrium values are quite small. Under these assumptions, the authors obtain, using the small-parameter method, an approximate solution of the system of partial differential equations for the p-n junction, and an operator equation connecting the current through the junction with the voltage applied to it. Both slow and fast variations of the parameters are considered. In the case of sufficiently low frequencies, the operator equation reduces to an ordinary nonlinear differential

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ACCESSION NR: AP5014510

equation. It is pointed out in the conclusion that the equivalent circuit corresponding to the solution shows that the charging capacitance of the junction operates in parallel with the nonlinear active resistance and diffusion capacitance, something hitherto assumed in various approximations without sufficient justification. Orig. art. has: 14 formulas.

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-tekhnicheskiy institut pri Gor'kovskom universitete (Scientific Research Physicotechnical Institute at the Gor'kiy university)

SUBMITTED: 18May64 ENCL: 00 SUB CODE: EC

NR REF SOV: 009 OTHER: 001

Card 2/2

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, L.V.

Dynamic properties of a junction transistor oscillator. Izv. vys.ucheb.zav.; radiofiz. 2 no.5:766-775 '59. (MIRA 13:5)

1. Gor'kovskiy gosudarstvennyy universitet.
(Transistor oscillators)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

POSTNIKOV, L.V.; LYAPUKHOV, V.Ye.

Design of a transistorized voltage stabilizer. Izv. vys. ucheb. zav.; radiofiz. 6 no.4:840-847 '63. (MIRA 16:12)

1. Nauchno-issledovatel'skiy fiziko-tekhnicheskiy institut pri Gor'kovskom universitete.

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

ASHBEL', N.I.; POSTNIKOV, L.V.

Calculation of transistor self-oscillatory circuits. Izv. vys. ucheb. zav.; radiofiz. 4 no.2:319-329 '61. (MIRA 14:7)

1. Nauchno-issledovatel'skiy fiziko-tekhnicheskiy institut pri Gor'kovskom universitete.

(Transistor circuits)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

ASHHEL', N.I.; POSTNIKOV, L.V.

Design of a transistor LR-oscillator. Radiotekh. i elektron. 11 no.1:116-122 Ja '66. (MIRA 19:1)

1. Submitted September 19, 1964.

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

33229

S/141/61/004/006/016/017
E192/E382

9,2560 (1040,1139,1160,1161)

AUTHORS: Ashbel', N.I. and Postnikov, L.V.

TITLE: The stability problem of transistor circuits

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, v. 4, no. 6, 1961, 1149 - 1154

TEXT: It is shown, on the basis of the diffusion equation describing the motion of the minority carriers in the base of a transistor, that the collector and emitter currents of a transistor can be expressed in operatorial form by:

$$\bar{I}_k = g_k \bar{v}_k - \alpha g_e v_e \qquad (6)$$

$$\bar{I}_e = g_e \bar{v}_e - \alpha g_k \bar{v}_k$$

where:

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E192/E382

The stability problem ....

$$g_k = \frac{qI_0}{kT} e^{qv_k/kT} \nu_1 \operatorname{cth} w\nu_1 = g_{k_0}\nu_1 \operatorname{cth} w\nu_1;$$

$$g_e = \frac{qI_0}{kT} e^{qv_e/kT} \nu_1 \operatorname{cth} w\nu_1 = g_{e_0}\nu_1 \operatorname{cth} w\nu_1. \quad (7)$$

In the above, $g = I_o\nu_1 \mathrm{cth}\, w\nu_1$, $\alpha = 1/\mathrm{ch}\, w\nu_1$, and $\nu_1 = \sqrt{1 + \tau_1 p_1}$. The other symbols are as follows:

- w is the normalized base width,
- $I_o = sqp_oD_p$ (s is the area of the base, q is the electron charge, p is the equilibrium hole concentration and D_p is the diffusion constant),
- k is the Boltzmann constant, and
- T is the absolute temperature;
- v_e and v_k represent small voltage deviations at the

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emitter and collector junctions with regard to the operating-point voltages v_1 and v_2.

The symbol p_1 in Eqs. (6) and (7) represents the Laplace transformation and it is seen that for $p_1 = 0$, Eqs. (6) are the same as the static equations of the transistor. Eqs. (6) can be used in investigating the dynamic behaviour of transistor circuits - in particular, their stability. This can be done by using the D-separation method (Ref. 4: Yu.I. Neymark - Stability of Linearized Systems - LKVVIA, L., 1949; Ref. 5: Yu.I. Neymark, Yu.I. Gorodetskiy, N.N. Leonov - Izv. vyssh. uch. zav., Radiofizika, 2, 967, 1959). The method is employed to investigate the stability of a blocking oscillator shown in Fig. 1. It is shown that the characteristic equation of the system is in the form of:

$$(L_1L_2 - M^2)(1 - \alpha^2)g_kg_ep_1^2 + \left[L_1g_e + L_2g_k - \alpha M(g_k + g_e)\right]p_1 + 1 = 0 \quad (9)$$

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By applying the D-separation method to Eq. (9), it is found that for small τ (where $\tau = \tau_1 / \sqrt{g_{k_o} g_{e_o} L_1 L_2}$) the excitation condition for the oscillations is almost identical with that of an oscillator described by static characteristics when the inertia of the carriers is not taken into account; as τ is increased, the self-excitation conditions deteriorate. For a given τ the excitation condition is improved by increasing the current amplification factor α_o and the ratio of the admittances of the emitter and collector junctions; the optimum value of the feedback coefficient is obtained when the product of the transformation ratio and the square root of the ratio of the emitter and collector admittances is equal to unity. A blocking oscillator can also be excited when provided with negative feedback but, in this case, τ should be of the order of 10^4, which can only be achieved if the inductances are small. In the case of the transistor, type П-16 (P-16), the inductances are of the order of 1 μH and it was therefore

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The stability problem ....

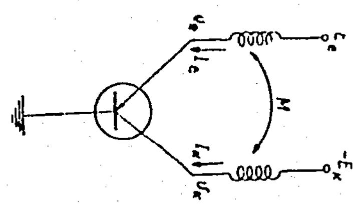
impossible to produce oscillations in the presence of a negative feedback.

There are 2 figures and 5 Soviet-bloc references (one of which is a translation from English).

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-tekhnicheskiy institut pri Gor'kovskom universitet (Scientific Research Physicotechnical Institute of Gor'kiy University)

SUBMITTED: May 20, 1961

Fig. 1:



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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

ACCESSION NR: AP4017040 S/0141/63/006/006/1216/1226

AUTHORS: Ashbel', N. I.; Postnikov, L. V.

TITLE: Concerning the theory of the LR transistor oscillator

SOURCE: IVUZ. Radiofizika, v. 6, no. 6, 1963, 1216-1226

TOPIC TAGS: oscillator, LR oscillator, transistor LR oscillator, phase plane, phase plot, limit cycle, stability boundary, stability boundary transformation, canonical transformation, pointwise transformation, self oscillating system, self oscillation period

ABSTRACT: The method previously developed by the authors (Izv. VUZ'ov-Radiofizika, v. 4, 319, 1961) for the calculation of the parameters of transistorized self-oscillating systems is used to determine the dynamic behavior of an LR oscillator. The static model of the transistor is employed. Generalized equations of motion are derived by approximating the transistor static characteristics by

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ACCESSION NR: AP4017040

means of piecewise linear functions. The phase plane is then broken up into linearity regions and the distribution of the equilibrium states in these regions and the stability of each state are then ascertained. The existence, uniqueness, and stability of the limit cycle are proved and the self-oscillation period determined. A qualitative comparison of the results with the behavior of a real transistor oscillator confirms the developed theory. Orig. art. has: 5 figures and 25 formulas.

ASSOCIATION: Nauchno issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Radiophysics Institute of Gor'kiy University)

SUBMITTED: 16Feb63 DATE ACQ: 18Mar64 ENCL: 00

SUB CODE: GE NO REF SOV: 011 OTHER: 000

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

ASHBEL', N.I.; YEMEL'YANOVA, I.S.; POSTNIKOV, L.V.

Use of single-terminal pairs containing a tunnel diode and a transistor in computer units. Izv. vys. ucheb. zav.; radiofiz. 6 no.4:833-839 '63. (MIRA 16:12)

1. Nauchno-issledovatel'skiy fiziko-tekhnicheskiy institut pri Gor'kovskom universitete.

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

ARANOVICH, V.G.; POSTNIKOV, L.V.

Dynamics of a multivibrator on plane semiconductor triodes. Izv.vys. ucheb. zav.;radiofiz. 4 no.6:1156-1170 '61. (MIRA 14:12)

1. Nauchno-issledovatel'skiy fiziko-tekhnicheskiy institut pri Gor'kovskom universitete.

(Oscillators)
(Junction transistors)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0"

"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

9,2560 (1040, 1159, 1161)

S/141/61/004/002/012/017
E192/E382

AUTHORS: Ashbel', N.I. and Postnikov, L.V.

TITLE: Calculation of Oscillator Systems Based on Transistors

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1961, Vo. 4, No. 2, pp. 319 - 328

TEXT: In the calculation of transistor oscillators it is often convenient to approximate the static characteristics of the transistors by sections of straight lines. It was shown in a number of works (Ref. 2 - L.V. Postnikov - Izv. vyssh. uch. zav., Radiofizika, 2, 767, 1959; Ref. 4 - V.G. Aranovich, L.V. Posthikov - Radiofizika -in print) that under these conditions it is possible to give a general solution of the problem. In the following, this type of solution is applied to an autonomous system with one degree of freedom, and one transistor. For the purpose of analysis, it is assumed that in an autonomous system of the second order the nonlinearity is due to the transistor alone. The equations of the static characteristics of the transistor can be written in the form

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(Ref 2):

$$J_K = g_m v_k - \alpha g_n v_{\vartheta}$$
$$J_{\vartheta} = g_n v_{\vartheta} - \beta g_m v_k \quad (1)$$

where J_K, J_{ϑ} and v_K, v_{ϑ} are currents and voltages of the collector and emitter, respectively. Eqs. (1) are linear in each of the four regions G_{mn}, which are defined by:

$$(-1)^m v_K \leqslant 0; \quad (-1)^n v_{\vartheta} \leqslant 0 \quad (2)$$
$$(m, n = 0 \text{ or } 1)$$

Further, it should be noted that $g_m \neq g_n$ for $m = n$ and

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$$0 < g_0^m < g_1^m, \quad 0 < g_0^n < g_1^n .$$

The parameters α and β for junction transistors are less than unity; on the other hand, for point-contact transistors, $\alpha > 1$, $\beta < 1$ and $\alpha\beta < 1$. The linear portion of the system can be described by the following set of equations:

$$a_{i1}\dot{x} + a_{i2}\dot{y} + a_{i3}v_{\kappa} + a_{i4}v_{э} + a_{i5}J_{\kappa} + a_{i6}J_{э} = b_{i1}x + b_{i2}y + b_{i3} \qquad (3)$$
$$(i = 1, 2, 3, 4),$$

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where a and b are constant coefficients independent of the parameters of the transitor and x and y are those variables which cannot undergo discontinuous changes. By substituting J_K and $J_э$ from Eqs. (1) into Eqs. (3), the following system is obtained:

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Calculation of Oscillator Systems... E192/E382

$$a_{i1}\dot{x} + a_{i2}\dot{y} + a_{im}v_{\kappa} + a_{in}v_{\tau} = b_{i1}x + b_{i2}y + b_{i3};$$
$$G_{mn}: (-1)^m v_{\kappa} > 0; \quad (-1)^n v_{\tau} > 0. \tag{4}$$

where

$$a_{im} = a_{i3} + g_m a_{i5} - \beta g_m a_{i6};$$
$$a_{in} = a_{i4} + g_n a_{i6} - \alpha g_n a_{i5}. \tag{4a}$$

It is now assumed that the determinant Δ, constructed from the coefficients of the lefthand-side portion of Eqs. (4), is different from zero in all the regions G_{mn}. In this case, the solution of these equations with respect to the variables $\dot{x}$, $\dot{y}$, v_K and v_{τ} is:

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$$
\begin{aligned}
A\dot{x} &= x \sum b_{l1} A_1^l + y \sum b_{l2} A_1^l + \sum b_{l3} A_1^l ; \\
A\dot{y} &= x \sum b_{l1} A_2^l + y \sum b_{l2} A_2^l + \sum b_{l3} A_2^l ; \\
Av_{\kappa} &= x \sum b_{l1} A_m^l + y \sum b_{l2} A_m^l + \sum b_{l3} A_m^l ; \\
Av_{\star} &= x \sum b_{l1} A_n^l + y \sum b_{l2} A_n^l + \sum b_{l3} A_n^l .
\end{aligned}
\tag{5}
$$

where the quantities A_j are the determinants derived from the determinant A of the system. The first pair of these equations represents the differential equations of the motion of the system, while the second pair determines the distribution of the regions G_{mn} on the xy plane. The linearity regions G_{mn} on the phase plane are determined by the inequalities:

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$$\Gamma_m = \frac{(-1)^m}{A}\left(x\sum b_{l1}A^l_m + y\sum b_{l2}A^l_m + \sum b_{l3}A^l_m\right) < 0;$$

$$\Gamma_n = \frac{(-1)^n}{A}\left(x\sum b_{l1}A^l_n + y\sum b_{l2}A^l_n + \sum b_{l3}A^l_n\right) < 0, \qquad (6)$$

from which it follows that, in general, the plane is divided into four regions by means of four straight lines issuing from the same point. From Eqs. (6) it is also found that if during transition from one region G_{mn} into another, the quantity A does not change its sign, the regions cover the whole phase plane without overlapping. On the other hand, if in three regions G_{mn} it is found that $A > 0$ and in the fourth region $A < 0$, the phase plane in this region is overlapped (three times). In this case, the system of equations is contradictory. The coordinates of the equilibrium states of the system can be obtained from Eqs. (5) by assuming that $\dot{x} = \dot{y} = 0$. The characteristic equation of the system of Eqs. (5) is in the form:

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$$Ap^2 - \left(\sum b_{i1}A_1^i + \sum b_{i2}A_2^i\right)p + \sum b_{i1}b_{j2}A_{12}^{ij} = 0 \qquad (12).$$

The correspondence functions for the case of a non-overlapping phase plane are determined and it is found that these functions are continuous and monotonically increasing or decreasing functions with continuous variables. The correspondence functions can be used in order to determine the periodic regimes of the oscillator and to study the stability of these regimes. However, this is a complex problem, which is not attempted in this work. There are 7 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-tekhnicheskiy institut pri Gor'kovskom universitete (Scientific Research Physicotechnical Institute of Gor'kiy University)

SUBMITTED: October 11, 1960

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"APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342620012-0

ASHBEL', N.I.; POSTNIKOV, L.V.

Stability of transistor circuits. Izv.vys. ucheb. zav.; radiofiz.
4 no.6:1149-1155 '61. (MIRA 14:12)

1. Nauchno-issledovatel'skiy fiziko-tekhnicheskiy institut pri Gor'kovskom universitete.
(Transistors)
(Electric circuits)

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68652

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E192/E382

9,4310

AUTHOR: Postnikov, L.V.

TITLE: Dynamics of an Oscillator Based on a Junction Transistor

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1959, Vol 2, Nr 5, pp 766 - 775 (USSR)

ABSTRACT: The oscillator considered is shown in Figure 1. It is assumed that the voltages at the collector and the emitter, with respect to the base, change comparatively slowly, so that the transient phenomena in the transistor can be neglected and it is possible to employ its static characteristics. The equations of motion for the oscillator can therefore be written as:

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$$L_1 \frac{dJ_e}{dt} + M \frac{dJ}{dt} + v_e = E_e ;$$

$$L \frac{dJ}{dt} + M \frac{dJ_e}{dt} + r_1 J + v_k = - E_k ;$$

$$C \frac{dv_k}{dt} + J_k - J = 0 ; \tag{1}$$

$$v_k = f_1(J_k, J_e); \quad v_e = f_2(J_e, J_k)$$

where the first three equations show a linear dependence between the variables while the last two are the equations

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Dynamics of an Oscillator Based on a Junction Transistor

of the transistor. In practice, it is possible to represent these two equations by linear approximations:

$$v_k = R_m(J_k + \alpha J_e); \quad v_e = R_n(J_e + \beta J_k) \qquad (2)$$

where α and β are certain normalised constants smaller than unity, m and n are subscripts having values 0 and 1, while R_m and R_n are constants assuming various values in the regions G_{mn}.
The inequalities:

$$(-1)^m v_k \lessgtr 0 \; ; \quad (-1)^n v_e \lessgtr 0 \qquad (3)$$

determine these regions. By introducing the conductances defined by Eqs (4) it is possible to express Eqs (2) in the form of Eqs (5), where the regions G_{mn} are again determined by formula (3). By introducing normalised

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Dynamics of an Oscillator Based on a Junction Transistor

variables ϑ, X, Y' and Z (defined on p 767), Eqs (1) can be written as Eqs (6). This system of equations can be investigated in the case of a small μ. In order to analyse the "slow" behaviour of the oscillator, a new variable $Y = -Y' - rX - E_k$ is introduced and Z is eliminated from Eqs (6). The resulting formulae are given by Eqs (7). By introducing new variables, defined by Eqs (8), Eqs (7) can be written as Eqs (9), where the parameters k and γ are defined by Eqs (10). The boundaries of the regions G_{mn}, determined from the first equations on p 769, are denoted by Γ_n and Γ_m. The points at which the phase trajectories come into contact with the boundaries are determined by Eqs (13) for Γ_m and Eqs (14) for Γ_n. The boundaries containing the "contact" points can be split into two parts: a segment, a line between a contact point and the point of intersection of the boundaries and a straight line lying on the other side

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Dynamics of an Oscillator Based on a Junction Transistor

of the contact point. If the points of the boundary Γ_m are denoted by $S_{m\nu}$ and those of the boundary Γ_n by $S_{n\nu}$, the equations of the boundaries are given parametrically by Formula (17). The coordinates of the point of the boundaries of Formulae (17) should satisfy Eqs (18). By solving Eqs (9) it is possible to obtain the transformation $S_{k\xi}$ into $S_{l\nu}$; this is defined by Eqs (20). The above formulae can be used to analyse a special case when the equilibrium state occurs in the region G_{01} and the contact points are on its boundaries. This case is represented by the parameters defined in Eqs (22) and (23). The transformations possible for this case are illustrated schematically in Figure 5. The so-called correspondence functions f_{ij} are indicated in Figures 7. The functions are defined as follows. Transformation of a point S_i into S_j by means of T_{ij} is

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